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ABSTRACT

To insure the most accurate research, it is necessary to have teams of scientists from the culture being studied and from a contrasting culture. The indigenous members of the team provide a sensitivity to nuances of meaning and interpretations of intent of behavior that cannct easily be recognized by an outsider. The outsider team members will contribute objectivity to the research. Working under this principle, the Child Development Research Unit provides an apprentice program to train indigenous behavioral scientists for research in Kenya. Students at the University of East Africa are hired as apprentices during their summer vacations. Each field team establishes a panel community, a set of households among which the mothers participate together in activities and form a social network including at least 100 preadolescent children. Since each field team designs its own research, many varied factors influencing the way in which children learn have been explored, including: salience of the father, composition of the household, sibling order, kinship network, nature of task assignment, schooling, mother's teaching style, and the experience of initiation. Other studies have dealt with physical growth, health, motivation, social behavior, and social institutions. Brief summary statements of these studies are included in this document. (Author/AJ)

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PROGRESS REPORT

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CHILD DEVELOPMENT RESEARCH UNIT

★

Harvard University,

Cambridge, Massachusetts

and

University College,

Nairobi, Kenya.

★

FEBRUARY 1970

PS 004521

Professor John W. M. Whiting
Director

Dr. Beatrice B. Whiting
Associate Director

Field Directors

Dr. Robert L. Munroe	1966–67
Dr. Thomas K. Landauer	1968
Dr. John D. Herzog	1968–69
Dr. P. Herbert Leiderman	1969–70

ERRATA

page 5, line 35)
page 9, line 2) for Kaggia, read Kagia
page 10, line 15)

page 14, line 12 for psysiognomies, read physiognomies

page 17, line 5 for progrress, read progress

PROGRESS REPORT FOR 1966-70

PRESENTED TO THE

PRINCIPAL, UNIVERSITY COLLEGE, NAIROBI,

BY THE

DIRECTOR OF THE CHILD DEVELOPMENT

RESEARCH UNIT

FEBRUARY, 1970

OUR knowledge of the principles of human behavior is in large part derived from intensive studies carried out by sociologists, economists, and psychologists on samples drawn from Europe and America. If one accepts the assumption of "the psychic unity of mankind", and there is no evidence that would lead one to doubt such an assumption, this research, in so far as it deals with basic psycho-biological variables, has a presumption of general validity. But principles dealing with cultural values or social structures derived from observations made on the modern industrial populations of Europe and America alone are surely limited in generality. It cannot be assumed that these principles will operate without modification in preindustrial societies or even industrial societies built upon a non-western cultural base.

Although anthropologists have struggled to keep social science from being entirely chauvinistic and bound by concepts and values of western culture, they for the most part have played the role of explorer and iconoclast. Most ethnographies are based upon two years or less of field work by a lone anthropologist who has had to learn the language as well as make his observations during this period. The results of such enterprises, although they have played a useful role in the past, are necessarily crude and need to be improved upon.

To establish a general science of human behavior, the universe must be all peoples of the world. Studies that have yielded results on western industrial populations must be replicated in other societies representing an adequate sampling of cultural variation. As the scope of investigation widens, new variables will be identified, new research techniques developed, and new principles discovered.

The first and most important step in breaking out of the bounds of western culture is to train a cadre of non-western behavioral scientists. This will make possible the establishment of research teams consisting of scientists of the culture being studied and scientists of another and perhaps contrasting culture. The indigenous members of the team provide a sensitivity to nuances of meaning and the interpretation of the intent of behavior that cannot be easily achieved by an outsider and certainly not in the time he is willing to carry on research in foreign lands. Furthermore, should he become so immersed in the culture that he can think, talk, act and feel like a native, he will lose the objectivity of an outsider. The insider, unless he has had wide experience in other cultures, is inevitably restricted in his outlook and either defensive or apologetic enough about certain aspects of his culture to bias his observations or his interpretations. Thus teams consisting of outsiders to provide objectivity and insiders to provide sensitivity, speaking to one another in "scientese", are required to accomplish our aim. An early successful team of this kind was Jomo Kenyatta and Bronislaw Malinowski (Kenyatta 1938).

The rapid development of higher education in the non-western world in recent years — especially in sub-saharan Africa, the Pacific Islands and southeast Asia, has made possible the recruitment of behavioral scientists from many diverse cultures, but progress is slow. The competition from law, political science, medicine and education is keen. "What is the use of basic behavioral science unless you can show its immediate utility? And what post shall I have when I return home with a Ph.D. in Psychology, Sociology or Anthropology?" say the undergraduates in these new non-western colleges and universities. It is only recently that chairs in one or another of the behavioral sciences have been established, the main emphasis having been on the humanities, the physical sciences and the professions. But even where such posts have been established, teaching loads are heavy and neither adequate time nor financial backing to carry out basic research is available.

In 1966, two prototype research units financed by the Carnegie Corporation were established. One, under the direction of Robert LeVine, of the University of Chicago, is sponsored by Ahmadu Bello University, Zaria, Nigeria. The other prototype unit, under the direction of John W. M. Whiting of Harvard University, is sponsored by University College, Nairobi, Kenya. This is now in its fourth year of operation. Both units are dedicated to the dual purpose of training Africans to be behavioral scientists and to carry out basic research with teams of "insiders" and "outsiders".

The first two units have been referred to as prototypes because it was hoped that if they succeeded in their purposes, they would be copied. If this were so, one might envisage an eventual world laboratory composed of many small research units whose staffs would collaborate on problems of mutual interest. Such collaboration would not only be between non-western and western scholars but also, and importantly, between staff members of two or more non-western units. An exchange between the Kenya unit and the Nigerian unit or between one of these and a Latin American unit or a Fijian unit or New Guinea unit or a unit in Southeast Asia is an exciting prospect.

THE RESEARCH APPRENTICE PROGRAM

The aims of these prototype research units are twofold : (1) to select and train indigenous behavioral scientists so that the unit can be Kenyanized as soon as practicable; and (2) to carry on a continuing program of research.

When the units were first established, there was considerable debate as to whether the first aim — that of developing and training a cadre of African behavioral scientists — could best be accomplished in the field or in the classroom. We chose to emphasize the former for two reasons: first, we felt that many of the conclusions, based as they were largely on research conducted in Europe and America, might not be either relevant or applicable in East Africa, and therefore to transport an American or British behavioral science curriculum in advance of any results from our research program would be inappropriate. And secondly, we believed that to work as an apprentice on a research program is a much more effective way of learning to be a professional in a field than reading textbooks and listening to lectures. Our classroom teaching has therefore been minimal, and we have put our main efforts into a program of research apprenticeship.

The apprenticeship program involves hiring students enrolled at the University of East Africa to work with us during their vacation. In all, during the first four years of the project, thirty-three students have worked as apprentices on one or another of our projects (see list of projects below). Nineteen of them are (or were) students in the

Faculty of Arts and four in the Faculty of Medicine of University College, Nairobi. Six have just finished their 6th form and have applied to the University. Two are attending University College, Dar es Salaam, and two others University College, Makerere.

As research apprentices the students have worked with one or more expatriate research associates on their projects. They have participated in all phases of the research-design, development of instruments, pretesting, data collection, and data analysis. Not only has this been a useful learning experience for them, but they have, in the role of "insider", made valuable contributions to the research.

In the beginning we took on students in their second or third year at the University, but we found that this did not permit an adequate opportunity for them to determine whether or not they were interested in becoming a professional behavioral scientist. We, therefore, turned to recruiting our apprentices from students who have completed 6th form and have applied to the University. The long hiatus at this time provides an excellent opportunity to begin one's apprenticeship, and it also enables the student, if appropriate research is ongoing, to continue his apprentice training during vacations throughout his college career.

As a part of the program to train professional behavioral scientists, two fellowships for post-graduate training in the States have been made available by the Carnegie Corporation as an adjunct to its grant in support of the Child Development Research Unit. Two students who had been research apprentices on the project have received these fellowships. Lea Sigei received her Master's degree from the School of Education, Harvard University (1969), and Sara Sieley is now at Harvard also working toward her Master's degree.

The plan of starting research training at the end of the 6th form has the disadvantage of prolonging the time required for producing behavioral scientists with advanced degrees. We believe, however, that this was not a mistake. Although at the beginning there were not enough interested and qualified university graduates to compete for the available Carnegie fellowships, this is no longer the case. We feel confident that among the apprentices now at the University there will be more than enough committed and highly qualified candidates for post-graduate training in the behavioral sciences, and if the program is continued, it will soon produce enough well-trained professionals with higher degrees for our goal of Kenyanizing the unit.

As stated above, we decided to begin with an apprentice training program rather than using the classroom to teach the subject matter of behavioral sciences. There has been continued pressure for the field director and research associates to offer courses and seminars in Child Development and Psychological Anthropology. We believe that it was proper to resist this pressure until our research program had been launched and we had some research findings to report. We feel that we have now reached that point. Accordingly, we have, in our request to Carnegie for the renewal of our grant, asked for the establishment of a lectureship in which an appropriate combination of Anthropology, Psychology, and Sociology and the findings of our research unit could be taught.

THE RESEARCH PROGRAM

The research strategy adopted by the Child Development Research Units is comparative. Ideas generated in one unit should be replicated in other cultural and environmental contexts. Even within one unit, comparison and replication is an essential part of the research design. The Kenya unit, for example, already has collected basic data on fourteen

panel communities representing either different cultures or different points on the traditional to modern and rural to urban dimension. The panel communities provide both a sample for controlled comparison using the cross cultural method, and an opportunity to replicate psychological studies in a variety of cultural contexts.

Although the strategy of comparison is a powerful one and essential to the development of a basic science of general applicability, there is a hidden danger that often traps the unwary — that of the *invidious comparison*. By this we mean statements whose subject is the name of a society or a culture and whose predicate is a comparative evaluation. Such statements are of little or no scientific value and are often unnecessarily offensive to one or another — sometimes to both — of the peoples being compared. On the other hand, a statement of the relationship between two variables that are found in different degrees in the two societies is scientifically useful and is not invidious. Let us give an example. In the "Six Culture Study", (B. Whiting 1963) a study of child rearing practices and children's behavior in six communities distributed widely over the world, it was found that Rajput children from Khalapur, Uttar Pradesh, India, were more egoistic and less altruistic than Gusii children of comparable sex and age living in Nyansongo, a community in western Kenya. This is an invidious statement. It has no generality beyond the two communities in question. It is our view that it is the responsibility of the comparativist to convert such statements into non-invidious and scientifically relevant statements by changing the subject from the name of the two societies to some variable that has a different value in the two communities and can be presumed to account for the predicated difference. In the above instance, it was assumed that the difference in the behavior of the children in the two cultures could be attributed to differences in complexity of social organization. The Rajput belong to a society with occupational specialization, a caste system, a priesthood, and an indigenous central government, while the Gusii traditionally had none of these but had a kin based social organization with little or no occupational specialization, no class or caste distinctions and no centralized political organization. The appropriate statement of the hypothesis, therefore, is that children in complex societies are more egoistic and less altruistic than children in more undifferentiated societies. This hypothesis was supported by the remaining four of the six cultures. Okinawa and Yankee cultures are more complex than Ilocano and Mixtecan cultures, and the children of the former are more egoistic and less altruistic than the latter.

As another consequence of the comparative strategy that we have adopted, a community rather than a society, culture, or tribe has been taken as our sampling universe. Thus, statements that are made about any one of the Kikuyu panel communities cannot be taken as representative of Kikuyu culture. If this were required for any reason, our strategy would call for a sample of communities drawn from each culture to be represented. Our wish to avoid invidious comparisons makes it unlikely that we will draw such a sample of communities. Our choice of panel communities is determined rather by the need to represent different values on some of the variables and dimensions that we believe to be important determinants of differences in child rearing practices. Such variables include modernization, urbanization, education, family structure, the importance and nature of clan organization, etc.

A panel community consists of a set of households whose women know each other and participate together in activities and thus form a social network. In order to get an adequate sample of children, the network has usually been extended until 100 or more preadolescent children are included. Basic demographic data have been collected on 14 such communities by field teams of American and Kenyan students supervised by the field director. This "Basic Data" includes a complete census and genealogy of each house-

hold, maps, plans of house and yard, work and educational history of all adults, etc. These data have been collected on standard forms and are on file at the office of the Child Development Research Unit at University College, under overall supervision of Mrs. Kusum Jerath, administrative assistant, where they are available to facilitate subsequent research of the unit. Procedures have been established for keeping in contact with each community, after the initial phase has been completed.

The fourteen panel communities that have been established to date are distributed by culture as follows: Kisa—2, Gusii—1, Kamba—1, Kikuyu—3, Kipsigis—4, Logoli—1, and Luo—2. Although some of these communities are small, particularly a Luo and a Kisa colony in Nairobi and a Kipsigis colony in Masailand, there are in all approximately 500 households (over 2000 individuals) on which basic data have been collected.

As part of the research strategy, each field team, in addition to establishing a panel community, carries out one or more research projects. In the case of American graduate students, these projects are generally the basis for their doctoral dissertation. The field directors and other senior staff have completed or are now engaged in research of their own.

Except for the collection of the basic demographic data on each panel community in a standard manner, the research has not been programmatic. Each field team has designed and planned their own research. As a consequence, a wide variety of topics have been explored. Despite this diversity several themes emerge. The greatest number of studies are concerned with children's cognitive development. The impetus for these studies has come from two main sources — the work of the Swiss psychologist Piaget and the research conducted in England and the United States exploring the academic competence and intellectual development of children brought up in divergent economic and social environments.

Many factors that might influence the way in which children learn to think have been explored. They include the salience of the father, the composition of the household, sibling order, the kinship network, the nature of task assignment, schooling, the teaching style of the mother, and the experience of initiation.

Other studies have been concerned with physical growth and health, with motivation, social behavior, and with social institutions. A brief summary statement of the studies that are underway or have been completed is attached.

PS 004521

STUDIES IN PROGRESS AND COMPLETED — 1966–1970

1. **Physical Growth and Health**

   1.1 *Infant Stress and Growth* — Thomas Landauer, James Kaggia, and John W. M. Whiting. Assisted by: Miriam Bwana, John Herzog, Jane Lelian, Julius Meme, Clifford Muchoki, James Mwaniki and Susan Weisner.

   1.2 *Norms of Growth and Health* — P. H. Leiderman and James Kaggia. Assisted by: Beatrice Babu, Violet Gaturu, Eunice Mutero, Arthur Ngirita and Florence Waithira.

2. **Cognitive Development and Abilities**

   2.1 *Masculine and Feminine Cognitive Styles* — John W. M. Whiting, Marylou Lionells and Jane Martin. Assisted by: Miriam Bwana, Esther Cherono, Myra Kagasi, Ruth Laban, Jane Lelian and Lea Sigei.

2.2 *The Effect of Initiation on Cognitive Style* — John W. M. Whiting and Jane Martin. Assisted by: Florence Avetsa, Sipporah Chelang'at, Irene Kamau, Jeans Kenani, Martha Pala and Sara Sieley.

2.3 *The Impact of Male and Female Initiation on the Self-Images of Adolescents* — John D. Herzog. Assisted by: Hunter Eliud, Charles Githuka, Wilfred Mbugua and Esther Waruiru.

2.4 *Some Effects of Cross-Sex Task Assignment* — Carol Baldwin. Assisted by: Daniel Nyawawa, Remigius Ogodo Ogana and Martha Pala.

2.5 *Sex Differences in the Construction of Diagonals* — Robert L. Munroe and Ruth Munroe. Assisted by: John Biya, Myra Kagasi and Joyce Mmene.

2.6 *The Effects of Age, Sex, and Residence Patterns on Attention Span* — Beatrice Whiting. Assisted by: Jane Geteria, Irene Kamau and Ruth Munge.

2.7 *A Transcultural Test of Memory* — Thomas Landauer. Assisted by: Jonah Ichoya, Myra Kagasi, Isaiah Kenani, Daniel Nyawawa, Remigius Ogodo Ogana, Francis Okeng'o and Susan Weisner.

2.8 *Reading Pictures: A Cross-Cultural Perspective* — Ruth H. Munroe and Robert L. Munroe. Assisted by: Gordon Ahleschwede, Printha Berry, Myra Kagasi, Mary Kushner, Joyce Mmene and Nana Wilson.

2.9 *Developmental Changes in the Understanding of Kin Terms — A Luo Case* — Lawrence Baldwin. Assisted by: Remigius Ogodo Ogana, Martha Pala and Miriam Bwana.

2.10 *Developmental Changes in the Understanding of Kin Terms — A Kamba Case* — Stephen Fjellman. Assisted by: George Mutua and John Kibinda.

2.11 *A Study of the Acquisition of "Natural" Semantic Categories* — Janet Fjellman. Assisted by: Jeremiah Kaleli, John Kibinda and George Mutua.

2.12 *Strategies Used by Mothers to Teach Conceptual Categories to their Children — A Kamba Case* — Janet Fjellman. Assisted by: Beatrice Nzainga.

2.13 *Strategies Used by Mothers to Teach Conceptual Categories to their Children — A Kikuyu Case* — Gloria Leiderman. Assisted by: Grace Mwotia and Lydia Kang'ethe.

2.14 *Cognitive Development and Mathematical Learning* — Gloria Leiderman. Assisted by: Grace Diru, Sarah Kabetu, Julius Meme, Serah Lukalo, Lydia Kang'ethe, Akumu Odende and Grace Mwotia.

3. **Motivation**

3.1 *Need and Perception of Coin Size* — Robert L. Munroe, Ruth H. Munroe and Robert E. Daniels. Assisted by: Hudson Adenya, Printha Berry, Josiah Embego, Nancy Glandon, Myra Kagasi, Joyce Mmene, Linda Monroe, Charles Ng'elechei, Lea Sigei and Fanuel Wakhu.

3.2 *Effects of Population Density on Food Concerns in Three East African Societies* — Robert L. Munroe, Ruth H. Munroe, Sara B. Nerlove and Robert E. Daniels. Assisted by: Hudson Adenya, Josiah Embego, Myra Kagasi, Ruth Laban, Joyce Mmene and Fanuel Wakhu.

3.3 *The Development of Social Attachments During the First Year of Life* — P. H. Leiderman. Assisted by: Beatrice Babu, Violet Gaturu, Eunice Mutero and Florence Waithira.

3.4 *Urban Woes: Themes in Swahili Popular Songs* — Thomas Weisner. Assisted by: Samuel Ngugi.

3.5 *The Effect of Sex Identity Conflict upon Cultural Stereotypes* — Robert E. Daniels. Assisted by: Charles Ng'elechei and Jane Martin.

3.6 *Urbanization, Modernity and Psychic Stress* — P. H. Leiderman, Thomas Weisner and Michael Saltman. Assisted by: Ezekiel Arap Chirchir, Edwin Luchemo and Arthur Ngirita.

4. Behavior

4.1 *The Effect of Age, Sex, Sibling Order and Task Assignment on Altruistic and Egoistic Behavior* — Beatrice Whiting. Assisted by: Jane Geteria, John Herzog, Irene Kamau and Ruth Munge.

4.2 *The Techniques Employed by Mothers and Child Nurses in the Training of Their Children*—Beatrice Whiting. Assisted by: Jane Geteria, Irene Kamau and Ruth Munge.

4.3 *The Effect of Setting on Children's Behavior — An Urban-Rural Comparison* — Beatrice Whiting. Assisted by : Susan Weisner and Grace Diru.

4.4 *Proximity Variations: Sex and Situation* — Sara B. Nerlove. Assisted by: John Biya, Ruth Laban, Jeremiah Ombegera, Cornelius Onsumu, Sara Sieley, Lea Sigei and D. Okara Kibegwa.

4.5 *The Behavior of Children in Nursery School* — Andrew Cohn. Assisted by: James I. Mwaniki.

4.6 *Household Density and Infant Care in an East African Society* — Ruth H. Munroe and Robert L. Munroe. Assisted by John Biya, Josiah Embego, Myra Kagasi and Joyce Mmene.

5. Institutions

5.1 *Studies of Self-Help: 1. An Ethnography of Self-Help in a Kikuyu Village* — John D. Herzog. Assisted by Hunter Eliud, Charles Githuka, Wilfred Mbugua and Esther Waruiru.

5.2 *Studies of Self-Help: 2. The Psychology of Mutual Assistance* — John D. Herzog. Assisted by Hunter Eliud, Charles Githuka, Wilfred Mbugua, Remigius Ogodo Ogana, Esther Waruiru and others.

5.3. *Studies of Self-Help: 3. Case Study of a Harambee High School* — John D. Herzog. Assisted by: Ron McEachin and Beth Pollock.

5.4 *Naming Customs and Family Size* —John D. Herzog. Assisted by Irene Kamau, Ruth Munge and Remigius Ogodo Ogana.

5.5 *A Preliminary Survey of the Parents of Nursery Centre Children in Four Communities in Kenya* — John D. Herzog. Assisted by B. K. Chana and Ruth Munge.

5.6 *The Effect of Urbanization on Family and Household—A Rural-Urban Model of Urbanism* — Thomas Weisner. Assisted by John Biya and Charles Imbwaga.

5.7 *An Ethnographic Study of Kariobangi Housing Estate, Nairobi* — Thomas Weisner. Assisted by John Biya, Charles Imbwaga, Joseph Kariuki, Samuel Ngugi and Susan Weisner.

5.8 *A Stochastic Model for Describing Residence in a Kamba Community* — Stephen Fjellman. Assisted by: John Kibinda and George Mutua.

5.9 *African Small Business in a Nairobi Housing Estate* — Thomas Weisner. Assisted by Joseph Kariuki and Samuel Ngugi.

5.10 *A Study of Kipsigis Law* — Michael Saltman. Assisted by Ezekiel Arap Chirchir, Jason A. Mutei and Richard Siele.

5.11 *Women in the City* — Ying-Ying Yuan. Assisted by Jane Wakairu.

5.12 *Study of Changing Relationships Between Men and Women Among the Kipsigis* — Melissa Llewellyn-Davies. Assisted by Mary Koe.

1. PHYSICAL GROWTH AND HEALTH

1.1. **Infant Stress and Growth** — Thomas Landauer, James Kaggia and John W. M. Whiting with the assistance of Miriam Bwana, John Herzog, Jane Lelian, Julius Meme, Clifford Muchoki, James Mwaniki and Susan Weisner.

A series of experiments showing that animals stressed during infancy subsequently grew more rapidly and eventually attained greater skeletal length than an unstressed control group, led us to explore the possibility that this effect might also be true in humans. We conducted two cross-cultural studies on a sample of societies in each major area of the world (Landauer and Whiting, 1964; Gunders and Whiting, 1968) and discovered that the hypothesis was apparently confirmed. Adult males were on the average two inches taller in societies reporting customary practices relating to infants judged to be stressful than the adult males in societies not having such practices. This association was statistically independent of differences in climate, mode of subsistence, estimated diet, and race. One of the growth-correlated stress-inducers in the cross-cultural studies was vaccination or innoculation for smallpox or other disease, which we believe to cause a stress response through its systematic involvement in immune reactions and their side effects. Subsequently, we studied the relation between infantile immunization and adult stature by reanalyzing data from the Fels and Berkeley longitudinal studies of child development (Whiting, Landauer and Jones, 1968). Again a positive correlation was found between early immunization and terminal stature, this time with parental height controlled statistically.

The suggestion that early immunization facilitates growth impressed us as being of great potential importance in many respects, ranging from possible explanation of secular trends in stature to questions of prescription of optimal child rearing practices, particularly inasmuch as early stress in animals causes a wide spectrum of effects on physiology, health, and behavior in addition to its effects on growth. On the other hand, all the data we had examined was correlational and thus, despite our extensive efforts to account for possible "third variable" and "backward causation" possibilities by partial correlation techniques, no certain conclusion has been possible. We felt that the question was so important, and the phenomenon so hard to accept intuitively in the milieu of current beliefs about growth, that a major effort should be launched to obtain direct experimental data.

Three panel communities in periurban Nairobi were selected for carrying out a prospective study of the effects of infantile immunization. There, according to the best information obtainable, almost all people over about 7 or 8 years of age had been vaccinated for smallpox, but because of some scheduling accident, few vaccinations had been performed in the last four years. This meant that there was a large group of infants who had never been vaccinated living in a larger group in which a sufficient number had been, so as to provide "herd immunity" for all and make it ethically feasible to vaccinate only a portion of the infants without exposing the unvaccinated remainder, the control group, to the risk of the disease. This also assures that the beneficial effects on growth, if any, of immunization will not be a consequence of protection from the specific disease as such since the disease rate should be essentially zero in both experimental and control groups.

A census of the village was conducted to find infants and children, establish their dates of birth, and reconstruct their medical histories with particular reference to immunizations. Other data of many kinds are available for the same children. In the summer of 1968, a week-long clinic was held to which all children under 5 were invited. At this

clinic, new medical histories were taken, each child was weighed, measured for standing height, if he or she could or would stand, supine length otherwise, and sitting height. Each was given a brief examination by a doctor, and a dose of piperazine citrate (round worms-ascaris are endemic in this village), and if chosen for the experimental group, vaccinated. Of 800 children seen at the clinic, approximately 400 had not been previously vaccinated, about equally distributed between the 0-2 and 2-4 age groupings. Of each group approximately 5/13 were given smallpox vaccinations. Assignments to the vaccination group were made randomly, and blindly, after the measurements were completed (except in a few cases where vaccination was counterindicated by the medical examination). About half of those vaccinated for smallpox were also given DPT vaccinations, and asked to go to their local hospital for follow-up doses. Our plan is to repeat the clinic at one to two year intervals so as to obtain longitudinal growth norms for both vaccinated and control groups, and to add new cohorts of infants to the study sample as time goes on. Of those who reach 2 in the control group, 5/13 will be vaccinated.

1.2. **Norms of Growth and Health** — P. H. Leiderman and James Kaggia with the assistance of Beatrice Babu, Violet Gaturu, Eunice Mutero, Arthur Ngirita and Florence Waithira.

It is now generally conceded that adequate physical growth and psychological development in the earliest months of life profoundly influence subsequent growth and development in later years. For example, malnutrition resulting from disease, an inadequate diet, or a combination of the two is thought to interfere with the optimal development of the central nervous system. Similarly adequate social and physical stimulation in the earliest months is considered to be one crucial element for the development of cognitive and motive abilities in the young child. The definition of these adequate physical and social nutriments remains unknown not only for the more developed societies, but especially for the developing societies where even the most rudimentary information on these phenomena are frequently lacking.

This study proposes to generate some basic physical and psychological data during the first years of life, relating this information to nutritional status, physical health, and social conditions within the home of the child. Sixty infants are being studied during the first year of life, 20 beginning at age two months, 20 at four months, and 20 at six months. The children are seen by the staff four times over a period of eight months. With this design, information on infant growth and development in the first 14 months of life should be available as a first approximation of early growth and development in a peri-urban Kenyan community. Follow-up studies, including increase in the sample size will be considered after evaluation of the preliminary findings.

2. COGNITIVE DEVELOPMENT AND ABILITIES

2.1. **Masculine and Feminine Cognitive Styles** — John W. M. Whiting, Marylou Lionells and Jane Martin with the assistance of Miriam Bwana, Esther Cherono, Myra Kagasi, Ruth Laban, Jane Lelian and Lea Sigei.

It has often been noted that males and females behave differently and have different styles of thinking. There has been considerable controversy as to whether this is innate or learned. Some hold that these differences in cognitive style are biologically determined — others that the differences are entirely due to roles arbitrarily assigned to men and women by the culture in which they are brought up.

There is ample evidence that appropriate behavior for males and females is defined differently in different cultures, but there is also a seemingly universal similarity in the behavior and thought styles of women of all cultures which differs from that of the men of all cultures. This suggests that differences between males and females in any culture may in part at least be innately determined.

To test the hypothesis that there are universally similar differences in the cognitive style of males and females, a transcultural test was devised. The test — the *Whiting, Lionells, and Martin Felt Design Test* — was suggested by the Franck test (1949) which showed consistent sex differences in the production of abstract designs. The latter test, since it involved pencil and paper, was found to be inappropriate for people with little or no schooling. Our modification involved arranging felt pieces of different shapes on a felt covered board of a contrasting color. Each subject is asked to construct six different designs, each on a board with a different incomplete design as a stimulus.

This "felt design test" has been given to over 400 subjects varying in age from 6 to 60 from seven of the panel communities. Similar differences were found between the designs constructed by males and females in each of the panel communities. When the scores were pooled, the largest and most consistent differences (all statistically significant at less than the .01 level) were that males more than females made (1) single rather than multiple designs, (2) designs that were built up rather than down from the stimulus, and (3) designs that were symmetrical both vertically and horizontally.

It was also discovered that for both males and females the probability of making a "masculine" style design increased with years of schooling. Although this effect of education was striking and highly significant statistically, it did not obscure the sex differences. These were equally strong at each level of education.

It is our interpretation that the designs made by men and women reflect the differences in the role requirements of men and women. The breadwinning role of the male requires long-term complex plans whereas child care and other female responsibilities, requiring as they do frequent interruptions, are more short-term and repetitive. We intend to explore this interpretation by examining the frequency with which boys and girls are interrupted by parental commands, by comparing the length of the attention span of boys and girls, and by analyzing the changes of focus and activity required by the various tasks assigned to boys and girls (see 2.6.).

2.2. **The Effect of Initiation on Cognitive Styles** — John W. M. Whiting and Jane Martin with the assistance of Florence Avetsa, Sipporah Chelang'at, Irene Kamau, Jeans Kenani, Martha Pala and Sarah Sieley.

It is a folk belief in most societies in which males are initiated into manhood by a formal ceremony involving circumcision that the rite is necessary to change an unmanly and somewhat feminine child into a mature and masculine adult. Taking these folk beliefs at their face value, Whiting has argued (Whiting, Kluckhohn and Anthony 1958, Burton and Whiting 1961) that these rites would tend to occur in societies where boys are "feminized" by an intense and exclusive relationship with their mother during early childhood — a condition which the initiation rite is intended to counteract by a ceremonial "brain-washing." The theory predicts circumcision at adolescence should be present in societies in which the roles of males and females are sharply differentiated and where the father's involvement with his infants and young children is minimal. Others argue (Young 1965) that such a psychological interpretation is unwarranted and that the folk belief as to the meaning of initiation rites simply refers to a sociological change of status and the rite is a dramatic announcement thereof, rather than a "brain-washing."

If the psychological hypothesis is correct, and the rite effects more than a sociological change of status, then it is possible that the cognitive style of an initiated male might be more masculine than it was before initiation. To test this hypothesis the felt design test described above (see 2.1.) was given a second time, a year later, to a sample of children in the seven panel communities in which it was previously given. An experimental group has been initiated in the interim while a control group matched by age and education will not have been initiated. The collection of these data has just been completed and no analysis has yet been made.

2.3. **The Impact of Male and Female Initiation on the Self-Image of Adolescents.** — John D. Herzog, assisted by Hunter Eliud, Charles Githuka, Wilfred Mbugua, and Esther Waruiru.

A second study of the effects of initiation is being carried out on adolescent boys and girls of our Kikuyu panel communities. This study is more intensive than the one described above (2.2.) and focuses on self-esteem rather than cognitive style.

In the Kikuyu study, approximately 35 boys and 35 girls who were initiated in December, 1969, are matched with equal numbers of the same ages who were initiated in 1968 or earlier, and with similar numbers of the same ages who will be initiated in 1970 or later. Each subject is interviewed twice : first, a week before the initiation "season", and again approximately two months after initiations have finished and the initiates have regained their full strength.

The interviews are concerned with the youths' estimates of their own physical and sexual vitality, their readiness for adult responsibilities, and their competence in carrying out every day tasks. The general hypotheses to be tested are that initiated boys and girls rate themselves as more "able" on these measures than do uninitiated boys and girls, and that the experience of initiation causes them to enhance their own self-ratings during the two-month period between the interviews.

2.4. **Some Effects of Cross-Sex Task Assignment.** — Carol Baldwin with the assistance of Daniel Nyawawa, Remigius Ogodo Ogana and Martha Pala.

This study explores the hypothesis that boys, if by accident of sibling order they are assigned tasks that are culturally defined as appropriate only for girls, will develop a feminine style of thinking and behaving. A fortunate fluctuation in the sex ratio of the younger children in one of our panel communities made this study relatively easy to carry out. There were twice as many boys as girls in the 3—15 year age group. There is a sharp division of labor in Luo culture, and many of the tasks assigned to girls such as toting firewood and water, washing, cooking and baby tending, are of such importance in the daily domestic routine of the household that the mother of a large family finds it difficult if not impossible to manage without help. Therefore if she has no daughters of the appropriate age, the mother will assign these "feminine" tasks to her son.

The sample for this study consisted of 60 children in the panel community aged 3 to 15—20 girls and 20 boys with sisters and 20 boys without sisters old enough to perform the tasks in question. The daily routine behavior of these children was then systematically observed and, as expected, the boys without sisters of an appropriate age performed significantly more tasks defined as feminine. The decision as to which tasks were feminine was based on a concensus from interviews both with the children and their mothers.

The older children, aged 7—15 (n=40) were then given the *Whiting, Lionells, Martin Felt Design Test* (see 2.1), an adapted version of the Osgood Semantic differential test (1957) and an adaptation of the Whiting, Chasdi and Antonovsky status preference test (1966). Each of these instruments was designed to test some aspect of sex differences in identity and/or cognitive style. The social interaction of the children was also observed and analyzed with particular attention paid to those types of behavior that occur with significantly greater frequency in one or the other sex.

Preliminary analysis of the data from this study indicates that boys assigned feminine tasks are more altruistic than boys who are only assigned masculine tasks.

2.5. **Sex Differences in the Construction of Diagonals.** — Robert L. Munroe and Ruth Munroe, with the assistance of Myra Kagasi, John Biya, and Joyce Mmene.

Another difference in the cognitive styles of boys and girls was discovered by the Munroes in the following study. When children were asked to copy designs made on a checker board, boys were more able to reproduce diagonal patterns than were girls of the same age. To test the hypothesis that this might in part be due to differential experience with the environment, 15 boy-girl pairs matched on age (3–7 years old) were chosen. Spot observations were made on each child for each of 20 days to determine what activities they were engaged in and how far they were from their own houses. For thirteen of the fifteen pairs, the boy was on the average further from home than the girl during free time ($P<.01$, sign. test). These same children were then given a block-building task. For ten of eleven pairs (there were two tied pairs and two pairs were unavailable for testing), the child found further from home was better at building ($P<.02$). Interestingly enough, the two girls who in the spot observations were found to be further from home than the boys with whom they were matched also surpassed them on the block-building task. Although with such a small sample these results were not statistically significant, they are suggestive enough to warrant further research.

2.6. **The Effects of Age, Sex, and Residence Patterns on Attention Span.** — Beatrice B. Whiting, assisted by Jane Geteria, Irene Kamau and Ruth Munge.

The ability to sustain attention is essential for success in school and competence in task performance. It is known that this ability increases with age, but few quantitative studies have been attempted. The present research is based on six 30 minute observations of 50 children in a Kikuyu panel community, ranging in age from 2 to 8 years. The number of times a child changes his focus of attention is recorded and this frequency will be related to age, sex, and residence patterns. The prediction is that (1) attention span will increase with age; (2) that controlling for age and residence patterns, boys will have longer attention span than girls; (3) that children who live in densely settled areas and interact daily with large groups of children will have shorter attention span than children from scattered homesteads; and (4) that children who are responsible for child care and chores requiring intermittent attention span will have a shorter attention span. This theory is based on the assumption to be tested that children engaged in child care and household tasks are interrupted more frequently than those who do not perform these tasks or who are assigned chores which require more sustained effort (see 1.2. for effects on cognitive patterns).

2.7. **A Transcultural Test of Memory** — Thomas Landauer with the assistance of Jonah Ichoya, Myra Kagasi, Isaiah Kenani, Daniel Nyawawa, Remigius Ogodo Ogana, Francis Okeng'o, and Susan Weisner.

No satisfactory transcultural test of intelligence has as yet been developed. This study is an attempt to validate a test designed to measure the ability for rote memory, an important component of intelligence, in a way that controls for cultural differences.

The test consists of 60 cards, each showing drawings of a boy and a girl from 30 different cultures distributed over the world. The drawings were made from photographs and represent the clothing, facial expression and skin color appropriate to each culture. Assuming these 30 cultures to be representative of the cultures of the world, a child from any culture should find in the set an approximately equal number of familiar and unfamiliar costumes and psysiognomies.

The task is to remember the names assigned arbitrarily to each of the 30 boys and 30 girls pictured. To make the test transculturally equivalent, the thirty most common first names for boys and for girls in the given culture are used. These are selected from census data and school records.

The experimenter goes through thirty of the sixty cards naming each boy and girl. The subject is then asked to recall the names when the pictures are shown to him again. Two days later the child is retested.

The test has been given to a sample of children from six of the fourteen panel communities. School records and CPE scores have been obtained on these children whenever possible to provide validation measures.

2.8. **Reading Pictures: A Cross-Cultural Perspective** — Ruth H. Munroe and Robert L. Munroe, assisted by Gordon Ahlschwede, Printha Berry, Myra Kagasi, Mary Kushner, Joyce Mmene and Nana Wilson. (Munroe & Munroe, 1967, 1969).

In schools throughout the world pictures are used in textbooks and in classrooms to teach symbols — words and numbers. It is assumed that the message of pictures is fairly self-evident and that a child on entering school does not need explicit instruction in learning to understand the language of pictures. The perception of three dimensionality and the understanding of distance, as denoted by relative size, are two of the aspects of the language of pictures which this study shows require learning.

W. Hudson (1960) devised a test of three dimensional perception which he gave to a sample of South Africans ranging in socio-economic status from illiterate miners to white South African school children with up to six years of schooling. The test measured the ability to make three dimensional inferences from a sample of 11 pictures. Hudson found that even those children with the greatest cultural advantages could only read 72% of the pictures correctly.

This study replicates the South African study, using five pictures, none of which corresponded to Hudson's original set, since it was found that the others were confusing to a sample of 5th and 6th grade children in the United States. Four of the five pictures used in this study were interpreted three-dimensionally by nearly all of the American fifth and sixth graders. Children were shown the pictures and asked a simple question which revealed their interpretation of the picture. "For example, one picture showed a boy standing on an outside stair. Heading in the direction of the boy, was a train. The artist had meant to indicate the boy gazing off while a train passed in the distance. How

could we tell this? Because the boy was large (i.e., meant to be standing in the foreground) and the train was very small (i.e., meant to be in the background)." (Munroe and Munroe, 1969). The child was shown this picture and asked, "If the train keeps going the same direction, will it hit the boy?" The correct answer is No.

The pictures were shown to 24 children ranging in age from 7—13 in the Logoli panel community. Thirty-five percent gave three-dimensional responses. Boys gave more three-dimensional responses than girls. In the United States 26 nursery school children aged 3 and 4 from upper middle class families were given the test. Forty-seven percent gave three-dimensional responses -- again boys giving more than girls. Twenty-four kindergarten children aged 5 and 6 from lower middle class families were tested and forty-one percent gave three-dimensional responses — once again more boys performing better than girls.

This study concludes that children must learn to read three-dimensionally in pictures and that even in the United States where children are constantly exposed to pictures one cannot assume that they all understand three-dimensionality until sometime after kindergarten.

2.9 **Developmental Changes in the Understanding of Kin Terms: A Luo Case.** — Lawrence Baldwin with the assistance of Miriam Bwana, Remigius Ogodo Ogana, and Martha Pala.

For a long time there has been a controversy in anthropology as to whether a kinship system should be understood as an extension and generalization of the terms used for the nuclear family and other near relatives (Murdock, 1949; Lounsbury, 1964), or whether it represents a set of terms describing the larger social structure in the first instance (Hocart, 1937). To study the way in which the kinship system is learned provides a clue as to which of these is the more plausible interpretation. The first position would predict that the terms referring to the immediate family would be the first to be learned; the second position would suggest that the complete system would be learned at once.

These alternatives were explored on a sample of 60 children from the Luo panel community. The sample consisted of 5 boys and 5 girls in each 2 year interval from 4½ to 18 years of age. Each child was given a modified version of the Romney-D'Andrade kinterm triads test (1964) and was asked to answer a set of questions intended to discover the subject's understanding of the logical aspects of the system. Each child of the sample was also given a questionnaire to determine which kinsmen he interacted with most frequently, in order to test the relation between behaviour and the meaning of kin terms.

Preliminary analysis suggests that the basis of meaning of kin terms shifts with age. For young children it is interactional and affective. Older children increasingly become aware of the formal and relational properties of the system as a whole.

2.10. **Developmental Changes in the Understanding of Kin Terms: A Kamba Case** — Stephen Fjellman with the assistance of John Kibinda and George Mutua.

The problem is identical to the Baldwin study (2.9) described above, but somewhat different methods will be used and the sample will be drawn from a Kamba panel community. The fact that adults in the community have been found to have quite different versions of their kinship system adds an interesting additional variable to the study.

2.11. **A Study of the Acquisition of "Natural" Semantic Categories.** — Janet Fjellman, assisted by Jeremiah Kaleli, John Kibinda and George Mutua. (J. Fjellman, 1969).

Almost all psychologists who have investigated cognitive development among rural African children have concluded that they cannot or at least do not think abstractly. They base this conclusion upon the fact that in several studies rural African children with little or no education (cf. Greenfield, 1966) tend to classify objects by color or other perceptual properties rather than by some more abstract "functional" attribute. All the studies from which these conclusions have been drawn have been based upon a task which requires the grouping of unfamiliar objects, which may well have led to the salience of color and shape.

In this study, pictures of familiar animals, birds, and fish were used as objects to be grouped. Thirty children (6—7, 9 and 12) were used as subjects. With these materials 63% of the children used abstract properties such as "they both can fly" or "are domestic animals", as the exclusive reason given for grouping pictures; and only 26% used color as a reason. This suggests that the supposed inability of African children for abstract thinking is an artifact of the test given.

Other results of the study were (1) children more closely approximated adult categories as they got older; (2) children consistently could group the pictures in an adult manner before they could give the adult reasons for doing so; (3) reasons for classifying are given for unfamiliar animals at a younger age than for familiar animals; (4) sorting is more accurate at a younger age for the more familiar animals.

2.12. **Strategies used by Mothers to Teach Conceptual Categories to their Children: A Kamba Case.** — Janet Fjellman with the assistance of Beatrice Nzainga.

Except for some recent studies carried out in Chicago by R. Hess and his colleagues (Hess, 1969), there has been virtually no research done on this important problem. The present study is therefore exploratory rather than an attempt to test a specific hypothesis.

The subjects for this study are a sample of seven year old Kamba children and their mothers. The task is to sort a set of styrofoam blocks of different size, color and shape by these three attributes. The mother is first given the task and shown the correct solution, if she cannot discover it herself. The child is then given the task which is difficult enough so that no seven year old can completely solve it. The mother is then asked to teach the child the correct solution, and the behavior, both verbal and manual, of the mother and the child, are scored by two observers. The few mothers so far observed show a wide variety of teaching styles.

2.13. **Strategies Used by Mothers to Teach Conceptual Categories to their Children: A Kikuyu Case.** — Gloria Leiderman, assisted by Grace Mwotia, and Lydia Kang'ethe.

Replication of previous study (2.12.) on a sample of Kikuyu mothers and children.

2.14. **Cognitive Development and Mathematics Learning.** — Gloria Leiderman, assisted by Grace Diru, Sarah Kabetu, Lydia W. Kang'ethe, Serah Lukalo, Julius Meme, Grace Mwotia, and Akumu Odende.

Readiness for and progress through school are assumed to be related both to biological-developmental antecedents and to the pre-school experiences of the child in interaction

with his environment. Considerable work has been done on differences between children from higher and lower socio-economic groups in both cognitive development and school performance in Western societies. In the developing countries, few data are available on children's cognitive growth or performance.

The purpose of the study, now in progrress, is to test groups of five and seven year old children from three of our panel communities representing differing degrees of modernization, to assess cognitive development and knowledge hypothesized to be related to the learning of abstract ideas, with particular emphasis on mathematical ideas. The test being used is an individually administered instrument translated from the version used in the U.S. and adapted so that the materials are appropriate to the experiences of the children in the Kenyan samples. The independent variables to which the children's performance at the beginning and end of the school year will be related are attendance at school, urban-rural residence, father presence in the home, economic index of the family's resources including material objects in the home, mother's interaction with the child, and observation of classroom activities.

3. MOTIVATION

3.1. **Need and Perception of Coin Size.** — Robert L. Munroe, Ruth H. Munroe and Robert E. Daniels, assisted by Hudson Adenya, Printha Berry, Josiah Embego, Nancy Glandon, Myra Kagasi, Joyce Mmene, Linda Monroe, Charles Ng'elechi, Lea Sigei and Fanuel Wakhu. (Munroe, Munroe and Daniels, 1969).

A number of studies in recent years have treated the general hypothesis that perception is affected by motivational variables. The reference study in this area is Bruner and Goodman's (1947) demonstration of a difference between "rich" and "poor" children in the estimation of coin sizes. Poor children, in overestimating the size of coins more than rich children, were inferred to be "accentuating" the coins because of their stronger needs. Subsequent work has tended consistently to yield at least partial confirmation of these findings.

The present study was designed not only to replicate the above studies to discover whether the same psychological principles held in non-Western cultures, but also to test the hypothesis that children would feel themselves to be "rich" or "poor" in accordance with a different set of values than those which operated in the U.S. studies. Whereas wealth was measured by some index of social class such as the income or occupation of the father in the studies carried out in the States, it was assumed that this would not be an appropriate index in Kenya. Wealth in shillings was also not deemed to be a good index, especially in the traditional homes. It was assumed rather that the most salient index of wealth would be cattle for herdsmen and acres of land for farmers.

Two panel communities were chosen, one in which wealth was measured by the number of cattle owned by the father and one, a farming community, where the number of acres should be the more relevant index of wealth.

The sample for this study consisted of 44 children from 21 pastoral households, and 36 children from 23 agricultural households; there were 27 males and 17 females in the pastoral sample and an equal number of boys and girls in the agricultural sample, ranging in age from 7 to 13 years. The subjects were asked to judge which of a series of eleven circles drawn on a piece of paper — five larger than a shilling, five smaller than a shilling and one the same size — was the same size as a shilling.

The results confirmed the hypothesis. Children whose fathers owned the fewest cattle in the first community and children whose fathers owned the fewest acres in the second community tended to guess that the shilling-sized circles were larger than those guessed by the more "wealthy" children — i.e., they over-estimated the size of the coin.

3.2. **Effects of Population Density on Food Concerns in Three East African Societies.** — Robert L. Munroe, Ruth H. Munroe, Sara B. Nerlove, and Robert E. Daniels, assisted by Hudson Adenya, Josiah Embego, Myra Kagasi, Ruth Laban, Joyce Mmene, and Fanuel Wakhu. (Munroe, Munroe, Nerlove, Daniels, 1969).

The population of the world is increasing at an alarming rate. East Africa is no exception to this trend. Many hypotheses have been put forward as to the possible consequences of the resultant overcrowding. Both physical and psychological stress are supposed to follow. Some go so far as to prophesy that humans, like the lemmings, will commit mass suicide to escape from it.

The present study is concerned with a particular type of psychic stress — a concern with food — that is assumed to result from an increase in population density among subsistence farmers and herdsmen.

Three panel communities represent appropriate contrasts in recent population growth and in present density. Results from the 1962 census indicate a population density for the Logoli of 1440 persons per square mile, for the Gusii 691 persons per square mile, and for the Kipsigis 253 per square mile. In the 19th century the density for the Logoli was estimated at 70 per square mile — a 20 fold increase in 75 years. The Gusii population has nearly doubled in the last 14 years, whereas the Kipsigis have shown a 50% increase during the same period. Thus both with regard to present density and rate of increase, the three cultures hold the same rank with Logoli first, Gusii second, and Kipsigis third.

Concern with food was measured in a number of ways, the first being from analysis of food imagery in a sample of folktales drawn from each culture. The results were as follows: there were 8.3 food references per folktale in the Logoli sample, 4.0 in the Gusii sample and 2.9 in the Kipsigis sample. The Logoli score was significantly higher than either of the others, but the Gusii-Kipsigis comparison did not reach an acceptable level of confidence.

The second measure was obtained from a sample of 330 secondary school students (88 Logoli, 119 Gusii, and 125 Kipsigis). They were briefly shown a board attached to which were 20 objects, 7 of which were food items, and then asked to recall what they had seen. It was predicted that subjects with a high concern for food would remember more food objects. Results confirm the hypothesis. The scores for food objects were Logoli 42.3%, Gusii 37.5% and Kipsigis 35.7%. Again, the Logoli scores were significantly higher than those of the other two cultures, but Gusii and Kipsigis were not significantly different from one another.

A third measure using the same secondary school subjects was also a memory test, in this case based on recall of food words from a printed list of 18 words, 3 of which were food related. The results again showed the same rank order as population density.

A fourth measure, again from the secondary school subjects, consisted of choosing between an achievement related or food related interpretation of an ambiguous story. Here again the Logoli scored higher than the Gusii and Kipsigis, but the latter two did did not differ from one another.

Finally each of the subjects was asked to report a dream and these were scored for whether or not someone ate something in the dream. Curiously enough the results of this test showed a strong reversal of expectations. Only 12% of the Logoli sample reported dreams with eating imagery, while the Gusii and Kipsigis were 20% and 30% respectively. A satisfactory interpretation of this reversal must await further research.

Thus the hypothesis that population pressures lead to food concerns in a population of subsistence farmers and herdsmen is substantiated. The Logoli differed from the other two cultures on each of the tests. Differences beween Gusii and Kipsigis were, however, inconsistent.

3.3. **The Development of Social Attachments During the First Year of Life.** — P. H. Leiderman with the assistance of Beatrice Babu, Florence Waithira, Eunice Mutero and Violet Gaturu.

Given the prolonged physical dependence of the human infant, a nurturing agent must be present to ensure physical survival in the earliest months of life. Typically the nurturing agent is the biological mother, although in some human societies, the role is shared by other caretakers. This nurturing role is a multifaceted one; that is, in addition to basic physical care, the nurturing agent develops a social tie with the infant which, for the infant, is the genesis of later social behavior. This social tie helps ensure the survival of the infant and, ultimately, may ensure the success of the species through the learning of adaptive social behavior.

Studies in mammals suggest the importance of both biological and social factors in the development and maintenance of these social bonds. Studies in higher primates have emphasized the greater contribution of social factors in the development of mother-infant bonds. Human studies are few in number, and rarely are they sufficiently detailed or continuing over a long enough time span to establish the contribution of the quality of the social interaction of nurturing agent and infant to the development of social attachments.

It is the purpose of this study to explore the relationship between infant-mother attachment and the variables of polygynous versus nuclear households, family size, household composition, and age and education of the mother. Sixty mothers and their infants in a peri-urban community will be the subjects of this study. The infants, ranging in age from two to six months at first observaion, will be tested on a measure of attachment to their mothers and other adults at two-monthly intervals for a period of eight months.

3.4. **Urban Woes: Themes in Swahili Popular Songs.** — Thomas Weisner, assisted by Samuel Ngugi.

Songs, poetry and other aesthetic productions of a culture have both an internal and an external reference. They are works of art, and as such can be studied for their own sake. They are also reflections of their environment, both social and physical. Songs and poetry express common cultural values, they reveal areas of tension and strain in interpersonal relations, and they state the concerns and troubles men face in dealing with their environment.

In traditional African cultures it is possible to identify such aesthetic productions. But where are they to be found in a study of urban culture? This study utilizes current popular song lyrics in an effort to understand the emerging urban culture in Kenya, and to identify the tensions and troubles common enough to be expressed in songs. What are the

characteristic themes in the songs — problems of migration, town women, troubles with the rural family, scarcity of money, the "country bumpkin" motif, and so on? These songs will be analyzed both in terms of their origin, their themes, their popularity, and their content. Data comes from recordings and translations of currently or recently popular songs.

3.5. **The Effect of Sex Identity Conflict upon Cultural Stereotypes.** — Robert E. Daniels, assisted by Charles C. Ng'elechi and Jane F. Martin. (Daniels. 1969).

It is a characteristic of all societies to describe their neighbors in terms of cultural stereotypes. To be successful, the society must have reasonably reliable expectations of the behavior of their allies and enemies. This reality aspect of intertribal stereotypes underlies the method of "reputational anthropology" suggested by R. LeVine (1966).

The basic hypotheses of this study are (a) a person's stereotypes of other groups are not simply objective observations, but contain a subjective element, which derives from the particular characteristics of one's own personality, and (b) to the extent that the members of a society share stereotypes involving systematic distortions of this type, this may be related to features of their culture which influence personality development.

To test these hypotheses, a sample of fifty-six Kipsigis adult males were interviewed concerning their childhood experiences, initiation, and views of five neighbouring tribes (Gusii, Kikuyu, Luo, Masai, and Nandi). Each sample member was asked to rank the five tribes on twenty-four personality characteristics represented by adjective pairs, such as cruel--not cruel, masculine--feminine, clever--foolish. Statistical analysis of the results yielded two general factors that are of interest to this study. Factor 1, *aggressiveness,* combined the traits hot-headed, arrogant, dangerous, cruel, and unruly. Factor 2, *manliness,* combined brave, strong in war, masculine, wealthy (in cattle), and weak in magic.

Generally, the subjects considered the Masai to be the most aggressive and also the most masculine, and the Luo least aggressive and least masculine. The judgements on levels of aggressiveness (factor 1) conform to what one would expect from a knowledge of intertribal relations, and thus support the importance of a reality aspect in stereotypes as predicted by reputational anthropology. Whether or not these tribes actually differ in degrees of manliness (factor 2) is a question that lies beyond the scope of this study. What is important here is that the Kipsigis say they do, and they base this opinion on the presence of male circumcision rites among the Masai and the absence of such rites among the Luo. Within their own culture, the Kipsigis believe that adult masculinity is established by such initiation. The differentiation between Masai and Luo on this factor is thus interpreted as a projection of Kipsigis values onto judgments made about these other tribes.

Following Whiting's hypothesis (Burton & Whiting, 1961) that the belief in the need to ceremonialize the achievement of manhood by initiation rites arises from a conflict in sex identity, it was hypothesized here that the se subjects, with few ambiguities about their own sex identity, would judge the major difference between the Masai and Luo to be in aggressiveness, while the subjects with sex identity conflicts would emphasize the difference between these tribes in terms of manliness.

Whiting has argued that one of the causes of conflict in sex identity might be the low saliency or absence of the father during very early childhood. Under such conditions the male child would at first identify with the mother, and this early identification would

conflict with the masculine identity that developed later in childhood. It also follows from Whiting's interpretation of the initiation rites that the more severe they are, the more likely they are to resolve such sex identity conflicts in favor of strengthening masculine identity in adulthood.

The measures of sex identity used in this study included the *Whiting-Lionells Martin Felt Design Test battery* (see 2.1). Another measure of sex identity was suggested by the Munroes (R. L. Munroe, 1964; R. H. Munroe, 1964) who have shown that men who have symptoms of illness during their wives' pregnancies do so as a reflection of feminine sex identity. Thirty-one of the fifty-six subjects reported experiencing such symptoms. Subjects were also asked how long a period they felt a man should refrain from sexual intercourse with a wife following the birth of her child (post-partum sex taboo). The interpretation made here was that men reporting longer periods were influenced by protective feelings toward mother and child, which was considered a feminine response, and those men who reported shorter periods were influenced by more masculine concerns.

The results have confirmed some, but not all, of the hypotheses. Father absence is significantly related to relatively feminine responses on each of the sex identity measures mentioned here. The severity of individual initiation experiences was related to two sex identity measures, but not to others. From the measure concerning stereotyping, father absence, as predicted, was related to a tendency to differentiate between Masai and Luo on the projective factor, rather than on the reality factor. Severity of the initiation, however, did not show any influence on stereotyping.

In contrast to these positive results, and contrary to expectations, no direct relationship was found between scores on any of the sex identity measures other than the measure of stereotyping.

In sum, there is some evidence that stereotyping is in part projective, but more research is needed before the importance of specific personality characteristics can be accurately estimated.

3.6. **Urbanization, Modernity, and Psychic Stress.** — P. H. Leiderman, T. Weisner, M. Saltman, assisted by Arthur Ngirita, Ezekiel Arap Chirchir, and Edwin Luchemo.

Does urban residence lead to psychic stress? There is a long tradition in sociology arguing that it does, based on the theory that disruptive changes in one's physical and social environment are stressful. Yet there is surprisingly little evidence to support the hypothesis that urbanites suffer from stress more than rural dwellers. Indeed, we suggest that most men in towns in Kenya will not exhibit symptoms of stress if they are participants in viable, rural-urban social networks of relatives and friends. Studies of Weisner (see 5.6) indicate that such networks are indeed of considerable importance in urban and rural areas. We do expect, however, to find evidence of psychic stress among women in rural settings where the husband is working in a town and where residence is virilocal. Women who live in the husband's rural home area while he is absent working in town have, we predict, suffered the most from "social disruption."

Disruption will be measured by number and kinds of moves within rural areas and to towns, and by the types and intactness of social networks. Modernity measures come from educational levels and from a cross-cultural attitude measure of modernity developed by A. Inkeles (Inkeles, in press). Stress measures also come from a questionnaire developed by Inkeles. Some forty families in three different rural communities will be studied as well as a group of urban residents.

4. BEHAVIOR

4.1. **The Effect of Age, Sex, Sibling Order and Task Assignment on Altruistic and Egoistic Behavior.** — Beatrice B. Whiting, assisted by Jane Geteria, John Herzog, Irene Kamau and Ruth Munge.

Previous research has shown that children who grow up in complex societies where there is specialization of occupation, a centralized government and social classes are less apt to offer help and comfort to others, less apt to attempt to motivate others to behave responsibly, and more apt to dominate others for selfish motives, to seek help, and to seek attention and praise. These behaviors have been summarized as altruistic and egoistic behavior (Whiting and Whiting, in preparation). One theory advanced to explain these findings is that in subsistence economies children are involved in work which is central to the welfare of the family, they are needed by their busy mothers to help care for younger siblings, help cook and clean, help herd and garden. As a consequence, these children develop altruistic habits. In contrast children who spend most of their time in school and do not help in the family economy are more egoistic.

The present study is a further test of these hypotheses. By studying individual differences between children, it will assess the importance of task assignment and schooling as a predictor of the behavior profile of children. Fifty children between the ages of two and eight years of age have been observed and their behavior in daily life settings recorded. Their altruistic and egoistic behavior has been coded and the chores they perform noted.

4.2. **The Techniques Employed by Mothers and Child Nurses in the Training of Their Children.** — Beatrice B. Whiting, assisted by Jane Geteria, Irene Kamau and Ruth Munge.

Mothers and child nurses throughout the world are responsible for training the newborn child to become a socialized member of his society Little attention has been paid, however, to the techniques these socializers employ, and few attempts have been made to assess the effects of different styles of training on the behavior of children. With a few exceptions, studies which have been made are based on reports given by mothers about their practices. It has been noted, however, in studies in which both interviews and observations have been used that mothers are not conscious of many of the techniques they use and cannot give valid descriptions of their behavior. In the present study mothers and child nurses are observed in the natural settings of their daily life and their behavior to their young charges is recorded.

4.3. **The Effect of Setting on Children's Behavior: An Urban-Rural Comparison.** — Beatrice B. Whiting, assisted by Susan Weisner and Grace Diru. (B. Whiting, 1969).

Students of personality have speculated as to the extent to which the behavioral profile of an individual changes in different settings. If personality is described in terms of patterns of behavior must one not then conceive of personality as chameleon-like? Perhaps, however, setting-specific habits become so ingrained from constant exposure that they are carried over to new settings. Thus when two age mates meet in the same place, the individual with more frequent exposure to one type of setting behaves differently from the individual who has spent more time in a contrasting type of setting.

Thomas Weisner's study of families with an urban and a rural household (see 5.6.) affords an opportunity for observing children who go back and forth from the country

to the city and makes it possible to assess the stability of their behavior profiles in the divergent settings. Furthermore, by comparing children who spend their early years in the country with their urban cousins it is possible to identify the habits which each setting reinforces. Previous research suggests that country life reinforces altruistic behavior while urban life reinforces egoistic behavior.

In this study a sample of children whose parents were all born in the same location will be observed in natural settings and their behavior recorded. The children range from 2–10 years in age. Some have spent little or no time in the city, some have lived almost exclusively in the city and some commute. The observations will be made by a sixth form apprentice who will observe in both the urban and rural settings.

4.4. **Proximity Variations: Sex and Situation.** — Sara B. Nerlove, assisted by John Biya, Ruth Laban, Jeremiah Ombegera, Cornelius Onsumu, Sarah Sieley, Lea Sigei, and D. Okara Kibegwa. (Nerlove, 1968; Nerlove, 1969).

Proxemics — "the study of how man unconsciously structures microspace — the distance between men in the conduct of daily transactions, the organization of space in his house and buildings, and ultimately the layout of his towns" (Hall, 1963) has attracted considerable attention recently, particularly among architects and city planners. It is assumed that the "most comfortable" distance from another is rooted in the "instinct" of territoriality but that it varies by culture — Arab college students stand closer to one another when conversing than do American college students (Watson and Graves, 1966) — and by situation — the task or activity that a group is engaged in influences the spacing between members of the group. There is furthermore some evidence that American women sit closer to one another than do men (Sommer, 1959). The present study is an attempt to discover whether the difference between the sexes is specific to American culture or is generally true of males and females in other cultures.

The study was carried out in a Gusii panel community. The subjects were 18 boys and 18 girls aged 5 to 8 years. Twenty spot observations — one each day but one for three weeks — were made on each child in the sample. The spot observation technique, adapted from Munroe and Munroe (1967) consisted of taking a mental snapshot the instant that the observer caught sight of the subject for whom he was looking. After recording the scene, the observer then asked a few questions in order to establish the following information: What activity is being engaged in? Is the subject under direction? Is he responsible for the care of another child? Who else is in the scene and how far is the subject from each of these people when first observed?

When the boys and girls were each rank ordered by age and paired, eighteen matched boy–girl pairs were established. In the spot observations in fifteen of these pairs the boy was further away from the nearest person in the group than was the girl. Furthermore girls were closer than boys to their most frequent companion—e.g., the one who appeared most commonly in a child's protocols. Both of these relationships were highly significant statistically.

It was also shown that proximity was influenced by the activity engaged in. For boys and girls combined, the average distance from the person nearest them while caring for a younger sibling was 1.77 ft., during free undirected time 3.38 ft., and while herding 5.51 ft.

Since boys and girls engaged in the above activities with differential frequency — there were only three observations of a girl herding — it was necessary to control for

activity. During free time boys were on the average 3.65 ft. from the nearest person while the girls were 2.89 ft. ($P<.001$). While caretaking no significant sex differences appeared and not enough observations of girls herding were made to adequately control for this activity.

That the same sex differences concerning the most comfortable distances from another have been found both among American college students and Gusii children suggests that this is not simply a result of culturally imposed sex typing.

4.5. **The Behavior of Children in Nursery School.** — Andrew Cohn, assisted by James I. Mwaniki. (Cohn, Mimeo, 1969).

Students of child development in the United States and England are concerned with the differential ability of kindergarten and first grade children from divergent economic and cultural backgrounds to profit by their school experience. In order to explore the problem, research workers have been making observations of the classroom behavior of children when they first attend school with the aim of attempting to relate differences in pre-school experiences.

In 1968 Burton White and his associates in the Harvard Graduate School of Education developed a code for analyzing the classroom behavior of children. The above code was used in a nursery school in periurban Nairobi. Twenty nursery school children — 10 boys and 10 girls — were observed each for six 10 minute periods and the frequency of 29 types of behavior recorded. The teachers were interviewed as to the age, sex and residence of these children. Although the sample was so small that comparison could not be made controlling for these variables, some of the findings were substantial enough and similar enough to some of the research reported for the United States to warrant further study. Of particular interest is the finding that girls become more involved in the classroom procedures and both participate in and enjoy more the activities prescribed by the teacher than do boys. Boys, on the other hand, interact more with each other, often when it is inappropriate in the school context.

Children who grow up in the center of town where the houses are crowded and the play groups are large, tend to spend more time in school interacting with other children, again often to the neglect of the school routine, than do children who grow up in homesteads surrounded by garden and pastures. The homestead children enjoy and participate more in the school program than their town agemates. This is also true of children of polygynous families who not only cooperate and participate in and enjoy the school program more but also behave in such a way as to indicate greater desire to cooperate and please the teacher. However, since polygynous children tend to live in homesteads it remains for future research to determine whether type of family or residence is the more important variable.

4.6. **Household Density and Infant Care in an East African Society.** — Ruth Munroe and Robert L. Munroe, assisted by John Biya, Josiah Embego, Myra Kagasi and Joyce Mmene. (Munroe and Munroe, 1969).

In a cross-cultural study Whiting (1961) found that the size of modal household in any culture was predictive of the degree to which infants were customarily indulged in that culture. It was reported that infants were cared for almost continuously in societies with large extended households in which grandparents, uncles and aunts were present.

Infants in societies with nuclear or mother-child households were said to be left to their own devices for longer periods of time.

This study investigates whether this effect is present within a single culture as well as across cultures. There were twelve infants available in the panel community at the time the study was done. The household in which each of these infants lived was visited briefly every day for a period of two weeks. Two things were noted (1) whether or not the children were being held by someone and (2) how long it took for someone to comfort him after he started to cry. If these two variables are taken as measures of indulgence the hypothesis was confirmed. Infants were more often held and more promptly attended to in large households than in small. Even with such a small sample the relationships were statistically significant — $P<.05$ and $<.005$ respectively.

The relationship between an infant and his mother was closer in the smaller household; the mother in a larger household is less often the baby's caretaker and is less often in close range (within 10 feet). The mother's lower availability was interpreted as probably due to the greater economic responsibilities she bears in a large household.

5. INSTITUTIONS

5.1. **Studies of Self-Help: 1. An Ethnography of Self-Help in a Kikuyu Village.** — John D. Herzog, assisted by Hunter Eliud, Charles Githuka, Wilfred Mbugua, and Esther Waruiru.

The national slogan of Kenya is *Harambee* ("Pull together ! "). Throughout much of Africa, "African socialism" is recognized, in various forms, as the preferred path to development. In Western countries, the young are fascinated with "community" and how to attain it; their elders bemoan the disunity and alienation evidenced in events of the past decade. These phenomena seem to have a common theme: the creation of conditions under which people can work together, help each other, cooperate, render mutual assistance. Both leaders and ordinary men want more of such behavior in modern life, but few understand how to encourage it or, indeed, can define what cooperative behavior really is. Few social scientists have studied "cooperation" or "mutual assistance", in an empirical manner.

In this study, the nature and structure of self-help groups in one panel community are being studied in detail. Such groups include (*inter alia*) a water scheme, a nursery school, a savings and credit association, women's cultivating groups, numerous small business partnerships, several cooperative societies, a high school, and a wide variety of family- and lineage-based activities. Research workers attend meetings, interview officers and Government officials, examine written records and minutes, and participate in varying degrees in the actual affairs of the organizations. Seven members of the panel community and a portion of the members of selected groups will be interviewed to ascertain their definitions of "self-help" and related concepts, the range of their memberships, and their knowledge and opinions of the group to which they belong.

5.2. **Studies of Self-Help: 2. The Psychology of Mutual Assistance.** — John D. Herzog, assisted by Hunter Eliud, Charles Githuka, Wilfred Mbugua, Remigius Ogodo Ogana, Esther Waruiru, and others.

This study is an extension of the ethnography of self-help described above.

In any community, some individuals participate very frequently in mutual assistance enterprises, some hardly at all. Analogously, among communities apparently very similar in economic base, formal education, historical tradition, etc., some employ mutual assistance techniques extensively, and others scarcely at all. The present research is aimed at isolating psychological and child training variables that distinguish "cooperative" individuals and communities from their opposites. We do not suggest that psychological factors explain all the variance among individuals and communities. We hope only to demonstrate that "high" cooperators evidence different values, motives, concepts of self, and techniques of training their children than "low" cooperators. We are looking for a pattern that might be dubbed "need for interdependence".

Although this research is still in its early stages, some characteristics of the "high" cooperator can be tentatively suggested. Such a man or woman is not primarily inspired by love of, or dependence on, others. Rather, he is motivated by considerations of his own self-interest, which he sees as best served by combining his relative small resources with those of others. He is moderately optimistic about others' long-range reliability, yet he is also a canny person, alert for evidence of chicanery and inefficiency. Above all, he is sociable: he enjoys being with other people, and he is trusted by them because he seems frank, understanding, and cheerful.

These ideas are being examined and extended through the administration of questionnaires and projective tests. The description of children's behavior collected by Beatrice Whiting and her assistants will be analyzed for modes of interaction characteristic of households "high" in mutual assistance (externally) and of those "low" in such associations. Finally, the research will examine the generational differences, testing the notion that younger people and children see much less advantage for themselves in joining with others than do older people, and consequently are less involved in self-help enterprises.

The subjects for this study are drawn mainly from two panel communities but it is hoped that the study can be extended to others.

5.3. **Studies of Self-Help: 3. Case Study of a Harambee High School.** — John D. Herzog, assisted by Ronald McEachin and Beth Pollock.

Researchers who study formal education are generally agreed on the need for more "natural history" descriptions of schools. This project will produce such a case study, of a type of school little known outside of East Africa, but bearing many resemblances to the "community schools" now springing up in American cities.

Harambee schools are the people's response, encouraged by the Government, to the post-Independence shortage of secondary school places in Kenya. In scores of villages, parents have joined together, raised impressive sums of money, and founded schools for primary leavers who are unable to attend a Government or "aided" secondary school. The goals of the parents are Junior and/or Cambridge School Certificates for the pupils, and the gradual takeover of the school by the Government.

This research examines in detail one such high school from its inception to the present, a period of two years. An American student teacher has taught and observed in this school. Research staff have attended committee meetings, parents' days, and *barazzas* about the school. Each school committee member, and other persons involved in the founding of the school and its continuation has been interviewed to secure his or her views on its progress and prospects.

Students of the school completed a questionnaire about their socio-economic background and occupational aspirations. This form was earlier administered in 15 other *harambee* schools by John Anderson of University College, Nairobi; the tabulated results will permit comparisons of the students of this school with a random sample from the entire country. An attempt is also being made to discover the students' concept of school. To this end a questionnaire/interview, aimed particularly at the student's academic self-image — his perception of himself as a past and prospective school achiever — is being administered.

5.4. **Naming Customs and Family Size.** — John D. Herzog, assisted by Irene Kamau, Ruth Munge and Remigius Ogodo Ogana.

Cultural factors affecting family size are currently the focus of considerable research, on an international scale. Much of this research has been carried out through the application of a standard "KAP" (Knowledge, Attitudes, Practices) questionnaire originally developed by the Population Council, and slightly adapted to local conditions in each case. A general hypothesis of the current study is that reliance on such a "cross-national" instrument may cause the researcher to overlook major determinants of family size that the questions of the instruments are not framed to elicit.

In Kenya naming practices and associated beliefs may well be one of these cultural factors which encourage large families. Kikuyu children are named (both traditionally and in modern times) in a rigidly determined sequential order, the first four after their grandparents and the next ones after the husband's and wife's brothers and sisters. In other cultural groups in Kenya there is no such custom and no obligation to name children after forbears. Parents from two of the panel communities, one Kikuyu and one non-Kikuyu, are being interviewed concerning their attitudes toward family size. These attitudes will be related to naming customs, as well as to age, education, and "modernity" and actual family size.

5.5. **A Preliminary Survey of the Parents of Nursery Centre Children in Four Communities in Kenya.** — John D. Herzog, assisted by B. K. Chana and Ruth Munge. (Herzog, 1969).

Nursery schools (or "centres") are a rapidly growing segment of the educational system in Kenya, although officially ignored in all but the bigger cities, except for registration purposes. In general, no adequate statistics are available concerning the nurseries. More importantly, no systematically gathered data exist as to why the parents have established the nurseries (which are mostly self-help enterprises), and what kinds of curriculum and teaching methods are prevalent in them.

In the present study, approximately 80 mothers of nursery school children from four areas (3 in Nairobi proper and 1 in periurban Nairobi) were interviewed concerning their reasons for sending their children to a nursery, and the means they employ for evaluating the experience obtained by the children in the school. These attitude questions were supplemented by inquiries into the socio-economic status of the household. The four samples were chosen largely on the basis of accessibility, and not according to formal criteria of representativeness.

Three major conclusions emerge from the study, which should be replicated more rigorously and extensively :

a. Regardless of socio-economic background, almost unanimously, parents look to the nursery schools for academic preparation for the early primary standards. Social and emotional "growth", while seen as desirable, is a distinctly secondary interest.

b. The typical nursery school child in Kenya is five, six, or seven years old, perhaps older; curricula and methods appropriate to three and four year olds in other countries are probably inappropriate to these youngsters.

c. Especially in the cities, parents look to the nurseries to protect their children from the corrupting influences of the urban environment. As the cities grow, so will pressures from the parents for more nursery "havens".

5.6. **The Effects of Urbanization on Family and Household : A Rural-Urban Network Model of Urbanism.** — Thomas S. Weisner. (Weisner, 1969).

Studies of urbanization in developing countries too often focus exclusively on men and families in towns. The rural backgrounds and rural social relations of townspeople have therefore often been excluded from urban studies, yet there is considerable evidence to show that these are of great importance. Rural-urban ties are likely to be of particular importance in the study of kinship, since most Kenyans in towns have a rural home as well as an urban one, have relatives in both places, and typically prefer their immediate family to alternate between rural and urban residence. Such families remain united and maintain kinship obligations in *both* their rural and urban homes. This is the major hypothesis being tested: urbanism in Kenya does not lead to family breakdown or nuclearization, but rather to the formation of mixed rural-urban networks of kinsmen, who maintain close ties with one another both in town and at their rural home.

5.7. **An Ethnographic Study of Kariobangi Housing Estate, Nairobi.** — Thomas S. Weisner, assisted by John Biya, Charles Imbwaga, Joseph Kariuki, Samuel Ngugi and S. Weisner.

Kariobangi is a "site and service scheme" development initially designed to provide plots for squatters to settle on. It has subsequently developed into a complex, lower-middle income, multi-tribal estate; most men are employed, most landlords are absentee, and there is a large local business community. How has Kariobangi changed from the original plans of its designers? What local community institutions have or have not developed? How is it governed? What are the attitudes of its residents towards the estate? To what extent can Kariobangi be called a "successful" development? These are some of the issues which are being explored. Data come from participant observations and interviews, Nairobi City Council minutes, and questionnaires.

5.8. **A Stochastic Model for Describing Residence in a Kamba Community.** — Stephen Fjellman, assisted by John Kibinda and George Mutua. (Fjellman, 1969).

The classical ethnographic method of describing residence patterns as matrilocal, patrilocal, neolocal or duolocal has been found inadequate to describe the household composition of most societies.

This study represents the application of a stochastic decision making model suggested by the work of Geohagen (Geohagen, 1967) in describing the residence patterns in a Philippine culture.

A record of the residence moves of 484 people living in 40 homesteads in a Kamba community was used as a basis for the analysis. Taking account of such factors as sex, age, divorce, death of spouse, numbers of previous marriages, and occupation, a model which accurately predicted approximately 95% of the observed residence decisions was derived.

5.9. **African Small Business in a Nairobi Housing Estate.** — Thomas Weisner, assisted by Joseph Kariuki and Samuel Ngugi.

The great majority of African business activity, rural and urban, centers in small shops. This study investigates one such business center in a housing estate in Nairobi. The major categories of business men have been interviewed including a 50% sample of those selling food and a 100% sample of all other types — in all 300 shopkeepers.

An analysis will be made of the shopkeepers' perceptions of the functions and purposes of a business, their methods of operation and their understanding of basic concepts such as capital, investment, profit and competition. These perceptions will be compared with those of rural shamba owners.

5.10. **A Study of Kipsigis Law.** — Michael Saltman, assisted by Ezekiel Arap Chirchir, Jason A. Mutei and Richard Siele. (Saltman, 1969).

In the new nations the political and legal institutions of the state have been superimposed on an indigenous system for maintaining order and settling disputes. Some communities have turned to the new institutions more readily than others. This study compares conflict resolution in three Kipsigis communities which have varying degrees of contact with the state's bureaucratic administration and explores procedural and substantive differences.

5.11. **Women in the City.** — Ying-Ying Yuan, assisted by Jane Wakairu. (Yuan, Mimeo, 1969).

Although there have been several studies of the migration of African men to the city, little has been reported on the life of women in the city. As the number of women living and visiting the city increases, more must be known about their participation in city life. Many questions can be asked. What women come to the city? Why do they come and how long do they stay? What is the influence of the husband on the decision to stay in the city or return to the shamba? Are children brought to the city? What jobs do women take? How do they learn about job opportunities and the facilities of the city? What views do women have about bringing up children in the city?

A pilot study of over a hundred women was conducted in Nairobi during June-August 1969. Census questions and questions about the urban history of the family were asked in addition to specific questions about living in the city. Fifty women in Kariobangi and fifty women attending a secretarial college in Nairobi were interviewed.

Preliminary analysis of the data shows that women with professional skills and jobs plan to continue living in the city. They express interest in the shops, and in the recreational and educational resources of the city and have many friends throughout the city. Most of the women, however, view their stays in the city as visits to their wage-earning husbands. Although they may stay as long as one year without returning to the shamba, they do not explore the city and stay most of the time in the housing estate. They believe

that the chances for receiving a good education are better in the city, but also believe that the city has many unhealthy influences on their children. They are therefore ambivalent about the future residences of their families.

5.12. **Study of Changing Relationships between Men and Women among the Kipsigis.** — Melissa Llewelyn-Davies, assisted by Mary Koe.

It has been assumed that in traditional societies in East Africa the relation between men and women is defined by accepted rules of role behavior rather than by their individual personalities. This study explores the effects of modernization on the attitudes of girls between the ages of 16 and 20 toward marriage and their perception of the female role. Interviews and psychological tests were given to discover whether modernization did indeed produce the expected shift.

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